Curriculum Differentiation Based Intruction for Gifted and Talented (G/T) Students (Mainstreaming Curriculum Differentiation within *Mixed Ability Classroom*)

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A. Introduction

Education is a basic element in enhancing human resources. Several attempts have been made to create high quality outcomes. For example since 2007, Indonesian government has implemented current curriculum called *Kurikulum Tindak Satuan Pendidikan* (KTSP/School-Based Curriculum) which is replaced previous curriculum called Kurikulum Berbasis Kompetensi (KBK/ Competence-Based Curriculum) and Indonesian Curriculum 1997.

Different from KBK and curriculum 1997 that organized by central government, KTSP is oriented to decentralize the whole process and procedure of teaching and learning in the schools. This change aims to cover the diversity of school and student's needs in each region. This is because the people who really know the student's needs are the educators in the school; therefore, the curriculum should be developed and established by them.

However, so far the instructional process which based on the KTSP was designed only for the average students with an average academic ability. It can be seen from the instructional design made my teacher in schools. Their instructional design is made for the whole students without pay special attention to the students who have high ability in learning or the students who have low learning abilities Meanwhile, a class is not only comprised of students with average ability but also students who are categorized as underachievers or as possessing above an average ability. Those who are underachievers need specific remedial education to provide them more time to complete learning materials. Those who have above-average ability need adequate educational programs to encourage optimal development. As a result, low average students are often left behind and above average students are bored, as they must adapt to the education level of average students.

Actually, in general, that Indonesian government has paid attention to the students diversity since 1974;, however the government does not provide specific curriculum and particular educational system for them. It can be seen from the data

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during 1972-1998 that the Ministry of Education in Indonesia just pay attention to G/T students regarding to the funding and privilege. For example, in 1974 Indonesian Government gave scholarship for G/T students who come from low income families, in 1984, the Government established the special school for G/T students in certain places, in 1994 the Government established school of excellent to facilitate them and the school were developed to acceleration program since 1998 (Sidi 2004:13)

However in any ways the educational program for G/T students has been criticized by many. Maria T (2004:12) argued that acceleration classes in Indonesia were implemented incorrectly. This is because its aim is only to have their students graduate and to continue to the university earlier. In addition, the process of identification of students used only IQ testing and teacher nomination

Furthermore there are several weaknesses of the acceleration class in Indonesia those are: firstly the acceleration class creates a stigma for regular classes, suggesting it is at a lower level than acceleration class. Secondly acceleration classes establish a superior culture that is exclusive, arrogant and elitist. Thirdly, it dehumanized the learning and teaching process. Finally the students in acceleration classes do not have a chance to encourage or grow their social relationships because of the number of courses and tasks which they have to accomplish in short time (Mujiran 2004:10). Additionally in many places thorough out the word that not all of the G/T students fix and require acceleration. Gross (1999: 99) said that:

'Not every gifted students require acceleration and not all require to be grouped with students of similar but for those, who do there exist a smorgasbord of research-supportive grouping and accelerative procedures from which the school can choose those that

Accordingly, it is necessary to implement an appropriate educational program for Gifted and Talented Students who usually called siswa Cerdas Istimewa (CI) that can cater their level of needs that is usually adjusted by students' readiness, interests, and learning profile. It seems that differentiating curriculum is determining the best teaching strategies to suit the students' type of learning, prior knowledge, skills and attitude in order to increase their learning achievements and gain advantages from those teaching strategies (Tomlinson 2004 : 56).

Interestingly, if curriculum differentiation is implemented for the regular class or mix ability classroom, so it can also be used for the students who are in low ability level without separating them from the other average or advanced students.

B. The conception of Curriculum Differentiation

1. Philosophy of Curriculum Differentiation

In general, curriculum differentiation is aimed at accommodating for student diversity. This is because a class usually consists of students with different cultural, social and economic background; different capabilities namely low, average and above average abilities; learning characters, etc.

Each student has different learning style and strategies to deal with the difficulties of learning within the classroom. Those who are classed as underachievers need specific remedial education to provide them with more time to complete the learning materials. Those who have above-average abilities need adequate educational programs to encourage optimal development (Davis & Rimm 2004: 26). Students with learning difficulties (LD) need individualized strategies that provide instructional variety, opportunities for heterogeneous peer interaction and differentiated outcomes within supportive, inclusive learning circumstances (Baker & Zigmond 1995:167).

Regarding above-average students, many educational experts categorize them as gifted and talented. Gagne (2003:1) defined the terms gifts and talents separately. Giftedness 'designates the possession and use of outstanding *natural* abilities, called aptitudes, in at least one ability *domain*, to a degree that places an individual at least among the top 10% of age peers'. While in terms of talent Gagne said that talent 'designates the outstanding mastery of *systematically developed* abilities, called competencies (knowledge and skills), in at least one *field* of human activity to a degree that places an individual at least among the top 10% of age peers who are or have been active in that field.'

There are several principles underlying the philosophy of differentiated curriculum, namely readiness, interests, learning profiles and affects (Tomlinson 2004: 45, 2003: 3; Danielson 1996: 35), student needs (Bender 2002:2; Diane and Harland 1993;156; Rosselli 1993;139) learning styles (Dodge 2005: 13) and students' experiences (Danielson 1996:41; Tomlinson 2003:Pp.23-24).

According to Tomlinson (2003:3), readiness refers to a student's knowledge, understanding and skill in relation to a particular sequence of learning. The readiness is influenced by cognitive proficiency, prior learning, life experiences and attitudes about school and habits. Student will learn when they work at a level difficulty that is both attainable and challenging. An interest is considered to be important in the learning process because interest in a subject can stimulate students to spend their time and energy acquiring knowledge, understanding and skills. Brophy's research shows that intrinsically motivated learning occurs if the learning experience suits to student's interest (cited in Danielson 2002:25). Thus teachers are expected to encourage interest and foster new interest of their students (Csikszentmihalyi, 1990: Tomlinson 2003 :3).

Another important aspect in learning is that the teacher must consider about their various students' needs, namely their intellectual, physical and emotional requirement as different needs require different instruction. For example, students with a physical limitation must be given an instruction which imply of how physical space is organized (Danielson 1996: 35). Additionally, Tomlinson classifies students' needs in five areas: affirmation, power, contribution, purpose and challenge. These five areas should form part of classroom practices and should be considered when catering for learners needs. (Tomlinson 2003: 20).

In regard to the learning style, it is necessary in developing the differentiated instruction in order to accommodate how student learn in their own style. There are many types of learning styles. Each expert has different term in classifying it. Rita and Dunn (1993:44) categorized learning styles into three types namely auditory, visual and kinesthetic. While Dodge (2005:13) argues that a learning style can be divided to four types based on cognitive diversity they are named mastery, understanding, interpersonal and self-expressive style. Tomlinson (2004:60) has different term because he prefers to use learning profile. According to Tomlinson, four factors can influence students' learning profiles and classified as learning styles, intelligence preferences, gender and culture.

Research that was gathered by Dunn from thirteen universities between 1980 to 1990 indicated that matching a students' learning style with compatible educational interventions positively impacted their academic achievements. (Dunn et.al 2009). Another research that has been conducted by Yeung, Read and Schmid (2005: 142) revealed that students who are categorized as introvert show better performance than those are extrovert, while those are categorized as thinker performed better than feeler. The implication of this research is that it is very important for the educators to know the learners learning style before designing the instructional practice and assessment.

Nevertheless, many have criticized learning style. One of the critics regards to learning styles model of Dunn and Dunn known as a Visual, Auditoria, Kinestetik (VAK) mode. This theory has been assessed by Coffield's team that concluded that: 'despite a large and evolving research programme, forceful claims made for impact are questionable because of limitations in many of the supporting studies and the lack of independent research on the model' (Coffield 2004:12).

To develop instruction to meet every student's need, however, it is not an easy job. Harland (cited in Maker 1993:156) stated that teaching to everyone's need is a noble goal but seems impossible in the context of a regular classroom which consists of a number of students. He adds that it is very difficult for kindergarten teachers with 60-70 students to reach these goals. In addition an implementation of differentiated curriculum should deal with teachers' teaching skills, styles and abilities to identify student's diversity (Harland 1993: 156; Kitano 1993:275-280).

Moreover, in regards to G/T students, curriculum differentiation is not the only one of methods to cater for student diversity because there are other provisions that can meet students' needs, such as enrichment, academic acceleration, grouping, tutoring and mentoring and curriculum compacting.

In terms of academic acceleration, many research studies have found that it has had a positive impact in meeting G/T students' needs, especially in developing creativity and thinking skills. The report *A Nation Deceived* summarises recent studies which show that acceleration is far more effective in increasing student achievement than even the most effective and comprehensive school reform models that have been introduced in recent decades (Kulik 2004:20). Academic outcomes of acceleration are impressive. Accelerated students consistently outperform non-accelerated ability peers (Rogers 2004: 65).

For many gifted students, acceleration provides a better personal maturity match with their peers than non-accelerated programs (Robinson 2004:65). It is also effective to adjust students' social identities as the program meets the social and emotional needs of the G/T student who are involved in it. Academic enrichment seems very valuable for most students. For G/T Student this provision can help them to meet their needs in advanced topics or themes with special treatment (Merrotsy 2007: 2).

Grouping is another program that has successfully supported G/T students both socially and intellectually, especially in developing their higher skills level. For instance, ability grouping within a class is a program which places some gifted students in a regular class per grade along with other regular students. Within the class, grouping often use different curricula be given to students who have a different ability levels, for example a math class that has students of low, average and high skill levels, teachers would use different materials depending on each group ability levels. The high level students would use material for grade 6, 7, 8, the average levels use materials for grade 5, 6, 7 , while the low ability students use material for grade 4, 5 and 6. (Kulik 2003: 273). Thus, David and Rimm (2004:12) state that G/T students should be divided to cluster based on their abilities, because if they are not grouped they are will be in deep trouble.

Nevertheless, the difficulties of developing instruction that is possible to meet students' needs in a regular classroom could be handled by well-planned classroom management such as providing individualised teaching, using a learning centre approach to individualised instruction (Conway 2005:227-257; Feldhusen 1993: 263-273; Lopez & MacKenzie 1993: 282-295).

Differentiated curriculum may facilitate those previous provisions as differentiated curriculum encompasses all the provisions which suit the students' needs

without separating G/T students from other students. Thus teacher can choose particular provision which appropriate with the students interests, needs and characteristics.

Gross (1999: 99-100) said that:

'Not every gifted students require acceleration and not all require to be grouped with students of similar but for those, who do there exist a smorgasbord of research-supportive grouping and accelerative procedures from which the school can choose those that meed the child specific academic and socio- affective characteristics and needs'

In addition, many studies dealing with curriculum differentiation reveal that the program can successfully accommodate and enhance G/T students' achievements. For instance, a research done by Noble (2004: 193) in two elementary schools shows that students are more successful learners as a result of curriculum differentiation as it able to cater for different students' intellectual strengths, and encouraging awareness of their own strengths and weakness in learning, students' respect for one another learning strengths.

Moreover, Street's research finding (1995: 67) has revealed that there are three inter-related factors that affected G/T students' achievements namely differentiated curriculum, affective curriculum and teaching strategies. Interestingly, curriculum differentiation is considered as the strongest single indicator of success among G/T students.

2. The Principals of Differentiated Curriculum for G/T Students.

There are several considerations in should be met in developing curriculum differentiation for G/T students; firstly, G/T curriculum has to be modified to meet their needs in cognitive, affective, social and aesthetic dimension; secondly the curriculum should be flexible for accelerated and enriched learning; thirdly, the curriculum has to be planed carefully, written clearly, implemented, and evaluated. (Baska 1996:126)

In practical, there are four principals of curriculum differentiation in catering those previous G/T student's needs, those are the modification of content, process, product and learning environment. This principle is proposed Maker (1982). However other experts proposed other principals in differentiating curriculum. Bloom for instance focus curriculum differentiation on developing skills through content- based experiences involves knowledge, comprehension, application, analysis, synthesis and evaluation (Gross et.all 2005:52). While Kaplan concentrated in incorporating multiple process skills with differentiated content and nontraditional products, for example Kaplan adds a basic, product and research skills in to differentiate a curriculum (Kaplan 1986:181-190). Williams' model has eighteen specific strategies and combines a three-

areal approach with focusing on the students' cognitive and affective abilities. The three areas cover subject content, teacher's behaviors or instructional strategies and students' behaviors. (William 1986: 463), and Baska (2006: 9) introduced three principals of differentiated curriculum involves content mastery, process and product, and epistemological concepts. Those curriculum principals are currently well known as the differentiated curriculum models.

However it seems that Maker's model which modifies content, process, product and learning environment is used as a reference by the others in developing curriculum. Content proposed that is *what* is to be learnt and is usually based on the syllabus expectations. It is comprises of the idea concepts, and information which will be presented to the students. To make the content suits the G/T students it must be more complex, more abstract, more varied and organized differently (Maker 1982 cited in Gross et all: 45)

Process is by which the content is taught. This may include teachers provide various materials, information and questions, facilitating independent learning, and varying activities from their learning resource centers. In order to be appropriate for G/T students the modification should be done on the level of thinking required, the pace of teaching and the type of strategies used.

The product is the use of a variety of resources to complete tasks and encourage skill development. Differentiating products will synthesize all educational components and incorporates an evaluation. Differentiating the *learning environment* equips a variety of instructional organization within the classroom ecology. There are several requirements in modifying learning environment for G/T students those are: it is designed as student centered, acceptable, opened, complex and abstract, and it is attempted to motivate students to be independent and high mobility learners. (Gross et.all 2005:40-41).

3. The Principals of Differentiated Instruction for G/T Students.

According to Roger (2002 : 45) instruction is the way that a curriculum will be taught. Instruction has three components: they are management, delivery and process modification. Management is related to the ways to organise the learners, delivery is the instruction model that will be used, and the process of modifications is the strategy of how teachers will teach and students will learn.

Regarding differentiated instruction, the principal of instructional management is accommodating and catering to the students' diversity and needs. This is because differentiated instruction is a mix of whole-class, group and individualized activities (NSW Department of Education and Training 2004:12).

In terms of the delivery component principle, differentiated instruction for G/T students involves modification of content, process, product and learning environment based on a students readiness, interests and learning profile (Tomlinson 2004:73). Some of the methods of differentiating content include concept-based teaching, curriculum compacting, the use of varied text and resources materials, learning contracts, mini lessons, varied support systems, note-taking organizers, and highlighted printed materials, digestion of key ideas, peer and adult mentors. Similarly, Makers (1982: 35) argues that the modification of the content of differentiated instruction involves creative thinking, task reflecting, higher levels of thinking, open endedness, variable pacing, group interaction, a variety of learning processes, debriefing and freedom of choice.

Meanwhile, differentiating process is determining the best teaching strategies to suit the students' type of learning, prior knowledge, skills and attitude in order to increase their learning achievements and gain advantages from those teaching strategies. This component should also consider the students' assessment type that will be conducted to reach the instructional goals (Tomlinson & Allan 2000 : 56).

The idea of the product should be the continuance of the process. Maker (1982 : 82) suggested that product which is expected from the students should be approximated, reachable, and novelty. Teachers must consider any real problems, and find solutions and evaluate the problems. It should not be formed as a summary but it should deal with the reconstruction of a student's mind.

"Regarding the principles of learning environment modification Maker (1982:85) noted :

G/T students need learning environment, which oriented to the student centered rather than teacher centered, encourage independence rather than dependence, be open rather than closed, be accepting instead of judging, be complex rather than simple, permit and encourage high mobility instead of low mobility."

In connection with the process of modification in differentiated instruction, it is necessary to respect that every student has different processes and goals to achieve, and will use different way to learn. Other important considerations include the consistency of the adopted management technique, routines and procedures of the learning environment, which implement a flexible, the teaching and learning (Algozzine et all. 1998 : 76)

The research conducted by Christensen has shown that modification in process benefits G/T students significantly from higher order thinking training – Habits of Mind. Whereas in terms of the modification of learning environment research shows that ability grouping for specific instruction is effective for all students including gifted students but only if the curriculum has been differentiated (cited in Williamnson & Jane 2009: para 3).

4. Maker's Model of Curriculum Differentiation

Maker model provides a framework for developing optional material that can be incorporated into a program for gifted students. Not all of the possible adjustments need to be adapted; only those that will lead to meaningful outcomes for gifted students should be incorporated template below outlines the types of adjustments to curriculum that can be made.

Tabel .1

Maker model modification

Content modifications

Abstraction (The focus of discussions, presentations and reading materials should be on abstract concepts, themes and theories)	Going beyond the facts
Complexity (Complexity is determined by examining the number and difficulty of concepts and disciplines that must be understood or integrated)	Dealing with greater breadth and depth
Variety (Students can work on different aspects of a broad theme and in their areas of interest)	Being exposed to new ideas or content
Organisation (Content is organised around key concepts or abstract ideas)	Selecting new arrangements of content
Study of people (Students research the lives of creative and productive individuals)	Relating content to humans
Methods of inquiry (Students study the methods of inquiry used in different disciplines)	Relating content to the methods used in a particular field

Process modifications

Higher-order thinking skills (Instructional methods should stress the use rather than the acquisition of information)	Using questions from the analysis, synthesis and evaluation area of Bloom's taxonomy
Open–ended processing (Questions are provocative in that they stimulate further thinking and research into a topic)	Encouraging divergent thinking
Discovery (Activities stimulate inductive reasoning to find patterns and underlying principles)	Adopting an inquiry approach to determine own conclusions
Proof and reasoning (Students are required to explain the reasoning that led to their conclusions. Students learn about other students' approaches and learn to evaluate reasoning processes)	Being required to give reasons, substantiate conclusions
Freedom of choice (Choice of activities can be motivating and independent learning can meet the gifted student's preference for self-regulation. Some students need support to become independent learners)	Having opportunities for self-directed learning
Group interactions of like–ability peers (Structured and unstructured activities should be provided to enable both intellectual and socio-affective goals)	Enabling group problem-solving

Product modifications

Real–world problems (Products should address problems that are meaningful to the students)	Investigating real-life problems
Real audiences (Gifted students are not developing products that are evaluated only by the teacher)	Using products for evaluation by teachers, peers, community, particular readership
Evaluations (Gifted students' products should be evaluated by appropriate audiences, their peers and themselves)	Undertaking teacher assessment and student evaluation using pre-established criteria
Transformation (Original work is produced when students are engaged in higher-order thinking)	Finding practical uses for what is learned

(Adapted from Gross, Sleap & Pretorius, 1999)

5. The Strategy of Curriculum Differentiation

According to Tomlinson (Tomlinson, 1995a) there are four characteristics shape teaching and learning in an effective differentiated classroom

1. "Instruction is concept focused and principle driven." All students have the opportunity to explore and apply the key concepts of the subject being studied. All students come to understand the key principles on which the study is based. Such instruction enables struggling learners to grasp and use powerful ideas and, at the same time, encourages advanced learners to expand their understanding and application of the key
2. concepts and principles. Such instruction stresses understanding or sense-making rather than retention and regurgitation of fragmented bits of information. Concept-based and principle-driven instruction invites teachers to provide varied learning options. A "coverage-based" curriculum may cause a teacher to feel
3. compelled to see that all students do the same work. In the former, all students have the opportunity to
4. explore meaningful ideas through a variety of avenues and approaches.
5. "On-going assessment of student readiness and growth are built into the curriculum." Teachers do not assume that all students need a given task or segment of study, but continuously assess student readiness and interest, providing support when students need additional instruction and guidance, and extending student exploration when indications are that a student or group of students is ready to move ahead.
6. "Flexible grouping is consistently used." In a differentiated class, students work in many patterns. Sometimes they work alone, sometimes in pairs, sometimes in groups. Sometimes tasks are readiness-based, sometimes interest-based, sometimes constructed to match learning style, and sometimes a combination of readiness, interest, and learning style. In a differentiated classroom, whole-group instruction may also be
7. Used for introducing new ideas, when planning, and for sharing learning outcomes.
8. "Students are active explorers." "Teachers guide the exploration." Because varied activities often occur simultaneously in a differentiated classroom, the teacher works more as a guide or facilitator of learning than as a dispenser of information. As in a large family, students must learn to be responsible for their own work. Not only does such student-centeredness give students more ownership of their learning, but it also facilitates the important adolescent learning goal of growing independence in thought, planning, and evaluation. Implicit in such instruction is (1) goal-setting shared by teacher and student based on student readiness, interest, and learning profile, and (2) assessment predicated on student growth and goal attainment.

6. Steps of Development of Differentiated Curriculum

1. Identifying the students based on their ability levels (upper, lower, and average) in each subject. The process of identification of students in each subject must have a different identification strategy. In unit Bahasa Indonesian for example in particular subject such as reading,the students are grouped according to their reading ability. While in math, for example, students not only can be grouped based on the speed they understand the material but can also be grouped based on their mathematical learning styles, such as how to count, how to complete your math and so on
2. Exploring Compotence Standard (SK) and Based Competence(KD
3. Teachers modify the content, products and processes by category students who have made teachers
4. Modifying SK and KD by arranging three types syllabus and RPP

C. Conclusion

There are many ways for teachers in the classroom to create a better fit for more learners--including those who are advanced, average and bellow. In general, interest, learning style, readiness, motivation, experiences are some of students diversity that teacher or educator have to consider in designing their lesson plans. In the context of Indonesian educational system, there is a big opportunity for the schools to implement the curriculum differentiation either for gifted and talented students in a regular class or differentiate curriculum for all students based on their needs, interests, and ability. There are several reason regarding this, firstly Indonesian current curriculum/KTSP allow the schools to modify their own curriculum based on students' needs. Secondly, the regulation of Indonesian education No 20 on 2003 facilitates highly able students to gain special services. However, both Ministry of religious Affair (MORA) and Ministry OF Education and Culture (P&K) that are responsible to manage educational system in Indonesia should provide an appropriate curriculum for G/T students and financial supports to facilitate the development curriculum differentiation even this curriculum should be elaborated in the national curriculum both in MORA and MENDIKBUD. It also must be supported by the depth understanding and elaboration about the philosophy and principles underlie the differentiated curriculum which considers the Indonesian cultural context.

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